● PRINTER RUSH ●
(PTO ASSISTANCE)

Application :	09/751,826	**Examiner :**	S. BRINICH	**GAU :**	2624
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[RUSH] **MESSAGE:**

PLEASE PROVIDE PAGES 21 & 22 OF SPECIFICATION.

THANK YOU
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[XRUSH] **RESPONSE:**

INITIALS:

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assumed to have the stablest state. In Fig. 10, the stablest state is obtained when the output level of the light-receiving element 13 is about 110. In this embodiment, preheating and heat-keeping control are performed to eliminate output variations caused by the LED temperature range during the image read operation under a given atmosphere. As can be apparent from Fig. 10, a period required for the output level of the light-receiving element 13 to reach the stable state, i.e., "110" is about 60 sec from the start of LED emission. The preheat time is set to 60 sec in this embodiment. Note that all the LEDs are turned on in preheating so as to attain the stable state within a shortest period of time. Alternatively, a temperature sensor such as a thermistor may be arranged in the scanner unit to measure the actual temperature, thereby managing the preheat time.

The thermal equilibrium condition in the image read operation is given as follows:

{R(strong driving, 100%) + G(strong driving, 100%) + B(strong driving, 100%)}/6 = one color(strong driving, 100%)/2

The left-hand side of the above equation indicates that the carriage in the color image read scanning reciprocates three times, i.e., six scan operations. For this reason, heat to be generated is equal to 1/2 the

operation in which an LED of one color emits light. The percentage in the parentheses in the above equation represents the duty ratio of the emission time. In this embodiment, the ON/OFF control of the LED is performed at frequencies of 3.9 kHz, 6.25 kHz, and 6.51 kHz, and data are set in predetermined bits of a register (not shown) to allow control of LED emission duty ratios as 0%, 25%, 50%, 75%, and 100%.

When the LED relative emission intensity Iv is set in the stable state, the LED must consume the same power as in the image read state to maintain the stable state in an interval until the next image read operation is started. This control is heat-keeping control and represented as follows:

Heat Keeping = R, G(weak driving, 100%)

Fig. 11 shows changes in LED emission intensity when the heat-keeping condition is changed. The relative emission intensity is plotted along the ordinate when the relative emission intensity without any heat-keeping control is defined as 100%. The heat-keeping conditions are plotted along the abscissa. One color(strong driving, 50%) indicates the state of a current flowing in the image read operation and has the same emission intensity as in R(weak driving, 100%). When heat keeping is performed in R(weak driving, 100%), the same state as in the image read operation can be maintained regardless of